REMARKS

Applicants and the undersigned are most grateful for the time and effort accorded the instant application by the Examiner. Claims 1-21 were pending in the instant application at the time of the outstanding Office Action. Of these claims, Claims 1, 11, and 21 are independent claims; the remaining claims are dependent claims. Claims 1-21 currently stand rejected and the rejections have been made final. Applicants respectfully request reconsideration and withdrawal of these amendments in light of the foregoing amendments and the following remarks.

Applicants' representative conducted an interview with the Examiner on Wednesday, March 12, 2008. The claims, the rejections and the art of record were discussed. While no agreement was reached with regards to the claims, the art of record or the rejections, it was agreed that Applicants would submit a response for the Examiner's consideration.

It should be noted that Applicants have amended the independent claims and cancelled certain dependent claims from further consideration in this application. Applicants are not conceding in this application that those claims are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of the instant application. Applicants respectfully reserve the right to pursue these and other claims in one or more continuations and/or divisional patent applications. Applicants specifically state no amendment to any claim

herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claim Objections

Claim 20 stands objected to as containing a typographical error (depending from claim 1 rather than claim 11). In response, Applicants have amended claim 20 to properly depend from claim 11. Therefore, Applicants respectfully request reconsideration and withdrawal of this objection.

Claim Rejections under 35 USC 112

Claims 1-21 stand rejected under 35 USC 112, first paragraph, as failing to comply with the written description of the invention requirement. The Examiner asserts that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Applicants respectfully request reconsideration and withdrawal of this rejection.

Applicants had previously amended the independent claims to recite "untrained" input to make it even more clear, in light of the instant specification and claims, that raw input data (e.g., not from a training set) is utilized by the instant invention and is independent of any particular system/model (as much would be understood by one of ordinary skill in the art and will be clear from the remarks addressing the rejections under 35 USC §§ 102 and 103, below). Therefore, Applicants respectfully submit that one of ordinary skill in the art would readily understand this from the claim language employed

such that the claims do not contain subject matter not in compliance with the requirements of § 112.

Nonetheless, as Applicants were attempting to clarify that the invention was essentially unrelated to the art cited by the Examiner, Applicants have stricken the offending language from the claims solely in an effort to facilitate expeditious prosecution of the instant application. Therefore, Applicants respectfully request reconsideration and withdrawal of these rejections

Claims 1-21 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully request reconsideration and withdrawal of these rejections.

As above, Applicants had previously attempted to clarify that "untrained speech and audio data" really is "raw data" of the instant specification and continue to take the position that this would be readily understood by one of ordinary skill in the relevant art. Nonetheless, as above, Applicants have stricken the offending language from the claim solely in an effort to facilitate expeditious prosecution of the instant application. Therefore, Applicants respectfully request reconsideration and withdrawal of these rejections.

Rejections under 35 USC § 102

Claims 1-3 and 11-13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6073096 (Gao et al.). Applicants respectfully request reconsideration and withdrawal of these rejections.

Applicants previously attempted to clarify that raw input data could be clustered independent of any particular model or system (*inter alia*, because clustering is know to be done on unlabled/untrained input data) by adding the word "untrained" before input data in the claim (see *Specification*, pp. 7, lines 9-10 (no need for "seed", i.e., not working on training data). This attempt was apparently unsuccessful in that it appears to have caused confusion on the Examiner's end. To clarify that the teachings of Gao (as well as the other references) are completely inapplicable to the instantly claimed invention in as much as they do not teach methods of clustering data (and that such input data is the raw input data should be exceptionally clear from the following discussion), Applicants respectfully submit the following.

First, there appears to be a disagreement, namely, the Examiner is improperly reading the term "model" in the claims to encompass clustering itself, i.e., the Examiner's position seems to be "clustering" is a type of "modeling" and so portions of Gao (and other references) obviously talking about, *inter alia*, modeling (**and not clustering**) may be cited against Applicants' clustering technique. Applicants respectfully submit that this is incorrect both because one of ordinary skill in the art would not recognize clustering as a type of modeling and because of the claim language itself.

To make this explicit, Applicants respectfully submit that those of skill in the art understand that "[c]lustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters)" and that "in the case of clustering, the problem is to group a given collection of unlabelled patterns into meaningful clusters." Jain, A.K. et al., *Data Clustering: A Review*, pp. 264-65, ACM 0360-0300/99/0900-001 (2000) available at: http://www.cs.rutgers.edu/~mlittman/courses/lightai03/jain99data.pdf (hereinafter "Jain"). Furthermore, it is well understood by those of skill in the art that

> [i]t is important to understand the difference between clustering (unsupervised classification) and discriminant analysis (supervised classification). In supervised classification, we are provided with a collection of *labeled* (pre-classified) patterns; the problem is to label a newly encountered, yet unlabeled pattern. Typically, the given labeled (*training*) patterns are used to learn the descriptions of classes which in turn are used to label a new pattern. In the case of clustering, the problem is to group a given collection of unlabeled patterns into meaningful clusters. In a sense, labels are associated with clusters also, but these category labels are *data driven*; that is, they are obtained solely from the data.

Jain at pp. 265 (emphasis in original). So then, one of ordinary skill in the art would understand that the clustering technique of the instantly claimed invention is not "modeling" in the sense that the Examiner is reading it; that is, the raw input data is being worked on in the instantly claimed invention to cluster (group) it, whereas "modeling" is done once the data has been clustered. See *Jain* at pp. 311 (stating "Predictive modeling uses clustering to group items, then infers rules to characterize the groups and suggest models.").

As can be understood from this general review, clustering that is independent of a particular model would be understood by one of ordinary skill in the art to mean that clustering does not itself refer to modeling. This is especially true as used in the context of the claim language. For example, in claim 1, the phrase "said clustering being independent of any model..." is understood by one of skill in the art to refer to models that utilize the clustering, not that the clustering is itself a type of modeling. Thus, Applicants respectfully submit that Gao (and the other references cited against the instant application) are inapplicable because they do not teach the clustering methods of the instantly claimed invention. Specific remarks addressing the inapplicability of Gao to the instantly claimed invention are provided below to make it clear that Gao is not concerned with input data clustering methods.

As previously noted, Gao teaches that *"... [t]he present invention relates to speech recognition and, more particularly, to a system and method of speech recognition based on* ***pre-clustering of training models*** *for continuous speech recognition...."*. (*See* Gao et al. at col.4 ln.60 – col.7 ln.48; col.8 ln.43 – col.10 ln.2.) Gao thus does not teach in any way at all a system that clusters the input data **independent of models**. Gao's clustering method is not even emphasized, as the main focus of the teachings is that **training data** (speakers) may be clustered into classes to provide class-specific cluster systems, thus achieving a storage savings "*because the number of clusters is far fewer than the number of training speakers,* ***and it is relatively inexpensive to store a model for each cluster***." *Gao*, Col. 5, lines 23-24 (emphasis added). In other words, Gao does not even mention which clustering method is to be used on the input data, other than stating

that several methods could be used, and Gao certainly doesn't teach the instantly claimed input data clustering method. That is, Gao teaches that "speaker clustering may be performed by different methods" which are generally known and not the method employed by the instantly claimed invention. *Id*, Col. 5, lines 59-60. Thus it is unclear to Applicants why this reference is continually cited when it is clearly inapplicable to the instantly claimed invention. Gao does not teach nor is it concerned in any way with the instantly claimed invention's method of clustering raw input data.

To ensure complete clarity, Applicants additionally point out that the independent claims did and continue to recite, *inter alia*, "*said clustering* ***being independent of any model*** *wherein the splitting of* ***the input data*** *into a predetermined number of non-overlapping subsets* ***occurs independent of a model***". Claim 21 (emphasis added). To be sure, Gao does not teach this. The portion of Gao cited by the Examiner against this limitation is the speaker independent system (12). *Id*, Col. 9, lines 60-67; see *Office Action*, pp. 6. This speaker independent system has nothing to do with the instant claim limitation. Applicants respectfully submit that "speaker independent" does not mean "independent of any model" under any reasonable interpretation. See *Gao*, Col. 9, lines 32-41 (stating "Speech data from a test speaker is first decoded using a speaker-independent system to generate a transcription [used to rank the clusters].)

Additionally, Applicants respectfully note that the claimed limitation "wherein there is no variability in the clustering due to randomness" must be read in combination with the preceding claim language "said clustering being independent of any model" in order to understand the invention and that the cited portion of Gao is inapplicable against

this limitation as well. Claim 20. In the cited portion of Gao (Col. 9, lines 50-60) it is taught that the top K clusters can be selected by a transformation (of the model). Previously, Gao states that "[a] transformation technique...is used to transform ***the cluster-dependent model*** and bring it closer to the test speaker. Given some observations from a test speaker, a subset of clusters can be selected...". Thus, the Examiner has cited a portion of Gao clearly aimed at a model transformation (i.e., not the method of the claimed invention, i.e., clustering the input data itself to ensure no variability due to randomness). For at least these reasons, Applicants respectfully submit that Gao clearly falls short of the instantly claimed invention and request withdrawal of these rejections.

Solely in an effort to facilitate expeditious prosecution of the instant application, Applicants have amended the independent claims to recite, *inter alia*, "wherein said splitting step comprises *determining an eigenvector decomposition relating to the input data...*" Claim 20 (emphasis added). This amendment does nothing more than rewrite claims 4 and 14 in independent form. Applicants have cancelled claims 4 and 14 and amended claims 5 and 15 to change their dependencies accordingly. Thus Applicants respectfully submit that these amendments are appropriate for consideration in an After Final Amendment. Moreover, it should be clear that neither Gao nor Khun, nor the state of the art, either alone or in any combination, are sufficient to render the instantly claimed invention obvious under 35 USC 103. Therefore, Applicants respectfully request reconsideration and withdrawal of these rejections.

Rejections under 35 USC § 103

Claims 4-10 and 14-20 have been rejected under 35 U.S.C. § 103(a) as being obvious in light of Gao et al. in combination with U.S. Patent No. 6343267 (Kuhn et al.). Applicants respectfully request reconsideration and withdrawal of these rejections.

Applicants' remarks regarding Gao are applicable here. Also, Applicants' previously submitted remarks addressing the Kuhn reference remain equally applicable here and are therefore incorporated by reference. In brief, Kuhn does not add anything to the teachings of Gao and is equally inapplicable against the instant application because the cited portions of Khun **do not deal with clustering input data**.

To reiterate, as best understood, Kuhn deals with speaker and environment adaptation, which is fundamentally different from data clustering. In Kuhn, the eigenvector/eigenvalue decomposition, a standard mathematical technique, is used for determining a feature space in which to represent speaker models, i.e. **not to cluster input data**. One need look no further than the Abstract of Khun to understand this, wherein it states:

> A set of speaker dependent models or adapted models is trained upon...training speakers, one model per speaker, and **model parameters are extracted in a predefined order to construct a set of supervectors**, one per speaker. Dimensionality reduction **is then performed on the set of supervectors to generate a set of eigenvectors** on the set of supervectors **to generate a set of eigenvectors that define an eigenvoice space**...

Khun, Abstract (emphasis added). Clearly then, this has nothing to do with performing eigenvector/eigenvalue decomposition to cluster the input data, as in the instantly claimed

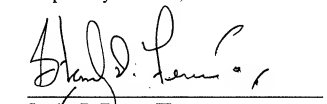
invention. Thus, Applicants respectfully request reconsideration and withdrawal of these rejections.

Conclusion

In view of the foregoing, it is respectfully submitted that independent Claims 1, 11, and 21 fully distinguish over the applied art and are thus allowable. By virtue of dependence from Claims 1 and 11, it is thus also submitted that Claims 2, 3, 5-10, 12, 13 and 15-20 are also allowable at this juncture.

In summary, it is respectfully submitted that the instant application, including Claims 1-3, 5-13 and 15-21, is presently in condition for allowance. Notice to the effect is hereby earnestly solicited. If there are any further issues in this application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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